

SIGMA XI QUARTERLY

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RESEARCH NUMBER

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Gift
Prof. E. C. Case
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SIGMA XI QUARTERLY

EDITORIAL COMMITTEE

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VOL. XV

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EDITORIAL COMMENTS

We welcome to the circle of chapters the Michigan State College Chapter, installed by President Moulton last spring. An enthusiastic Sigma Xi Club has been active at the institution for some years, and national officers of our society have been its guests. The account of the installation is given in this issue.

* * * * *

We have named this number of the Quarterly "The Research Number" for reasons that will be obvious to our readers. The fellowship fund for the ensuing academic year is in hand and has been awarded as per the report of the committee. The fellows of the preceding year publish in this issue the brief accounts of their work asked for, and we are glad to be able to present a paper by Professor Harris of the University of Washington on an engineering subject. The paper was originally presented before the chapter at that university and is sent us at our request that chapters submit for publication articles that have been especially prepared for chapter meetings.

We have just completed our circularization of the alumni in the interest of the fellowship fund. The mails have brought many interesting comments, some of which we hope to publish in December. We quote from an early response by an alumna in a small college in Missouri: "You will find enclosed my check for \$6.00. I intended to send \$3.00 each year for the Sigma Xi Research Fund, but had financial difficulties last year and was not able to send it. I am sending now for both years." The following from China is published verbatim: "Much as I appreciate your letter of April, I am unable to send in a contribution because: (1) I am under missionary salary, and (2) I am using all the cash I can spare to carry on my own in-

vestigations. Thus, although I cannot be a member in "paid-standing I am still carrying on the spirit of the Society—even in distant land continually torn by civil wars. I have recently had to move my entire outfit to new headquarters or lose the results of many years of drudgery. As it is we will probably lose our furniture and household outfit."

We have had replies from all continents. The "Spirit that is Sigma Xi" is permeating scientific circles all over the world.

CORRECTING SOME FALSE INTERPRETATIONS IN HYDRAULIC ENGINEERING

C. W. HARRIS

(A paper given before the University of Washington Chapter)

In the last quarter-century engineers have been showing strong tendency away from the physical meaning of hydraulic phenomena. Some of us believe that we have occasion for alarm if this tendency is not checked, for it has already given rise to numerous ambiguities and in some cases incorrect statements made with positive assurance.

The engineer is such a stickler for simple expression that he may be at times satisfied with the simplicity of the expression, even though the expression fails to state the truth he is seeking.

The study of the dynamic action of water invites familiarity because of the common household use of the substance dealt with. The school boy feels that he knows all about water and when he grows to be a man cannot believe that any important detail has escaped his observation. As a matter of fact, however, there are a large number of examples where popular expression is thoroughly in error. It might not be out of place to mention a few cases illustrating these mistakes.

Take, for example, the common case of the hose nozzle. Many people will insist that a pressure gage attached to the nozzle at its tip should read approximately the pressure in the hose. Perhaps these men should not feel entitled to an opinion, but they frequently are given to such presumptions and hold vigorously to their point of view until experiment eventually convinces them. There is no pressure at the extreme tip of a nozzle except that of the atmosphere.

As a second illustration we shall choose the case of a small pipe flowing into the end of a large pipe. This abrupt change in size of pipe is known to cause some loss of energy and the popular impression among those who know this fact is that the pressure in the large pipe will be lower than the pressure in the incoming small pipe. On the contrary, the pressure will be decidedly higher in the large pipe. The reason is well understood by physicists and engineers.

The third case is the throat of the Venturi meter. This instrument is nothing more than a contraction in a pipe line accomplished by a conical reducer followed immediately by a conical expander.

Engineers, of course, are intimately acquainted with the fact that the pressure at the contracted point is much less than at either side, but the laymen, even experienced plumbers and steam fitters, will almost invariably maintain that the pressure is higher.

As a fourth example of positive opinion contrary to fact, let us consider the force of a jet on a plate placed in its path. It is almost a universal impression that the force should be equal to the static force on an area equal to the area of the jet. On the contrary, however, the dynamic force is just double this amount.

A fifth illustration, which takes us more nearly to the point of this paper, is the plane or sharp edge orifice. Even the engineer, who generally accepts experimental values for the coefficient of discharge, will often insist that a rough orifice plate should result in a smaller flow through the orifice. This is the opposite from correct. The same orifice, flowing under the same pressure, will discharge more if the plate becomes rough and rusty, or if it is purposely roughened.

These five examples will serve to mark the way to an unlimited number of wrong conclusions. Few engineers become so intimate with the basic laws that they will not sometime resort to these early impressions and make statements that fail to bear close scrutiny.

A few years ago there appeared a bulletin from one of our universities on the subject of water measurements by means of orifice plates placed directly in the pipe line. This was a valuable contribution, containing a vast amount of experimental work—all, however, on plates of the same thickness regardless of the size of the orifice. In connection with the findings it was stated that the discharge should be the same if thinner plates were used.

Since this seemed to be in contradiction to the basic principles involved, a set of experiments were run at our laboratory, indicating a marked influence due to the plate thickness just as was anticipated. The author overlooked a very important fact, namely, that any appreciable thickness of plate, when submerged, causes the orifice to become a short tube. Now the discharge of short tubes depends basically on the length of the tube. Therefore, in this case, the discharge depends upon the thickness of the plate.

An interesting mistake in physical fact appeared in one of our old reliable text books published originally thirty-five years ago by one of the clearest thinkers who has ever published an engineering text. His work was enlarged and revised ten years after the first edition but without correcting the mistaken assumption. The problem was

the Pitot tube. By a simple line of reasoning, he arrived at the conclusion that the velocity of flow should be that due to a head equal to one-half of the indicated water column. His line of reasoning was as follows:

The cylinder of water approaching the mouth of the tube is deflected through 90 degrees, and, therefore, realizes the full momentum of this cylinder treated as a jet.

As a matter of fact only the central differential cylinder is deflected through 90 degrees, the average deflection being such that the total water column is just half that due to his assumption.

A false impression seems to prevail regarding the effect of viscosity on hydraulic losses. A fairly recent text book on hydraulics makes direct mention of the "Viscosity Factor" when referring to the relation of the ideal to the actual velocity of a jet. At the time this statement was called to our attention it so happened that we were conducting some experiments on the effect of viscosity, securing a wide range of viscosity by changing the temperature of the water from 4 degrees C. to 70 degrees C. with corresponding viscosities approximately 5 to 1. We found that the velocity factor, instead of varying with the viscosity as this author would have us believe, remained almost perfectly constant, and did not approach unity as we approached zero viscosity, as it should if the losses were primarily due to viscosity. In modern text book practice there is a so-called standard short tube, standard for no other reason than because several generations have used it. In late years this tube has been found to disobey the law of contraction. One author, at least, has mentioned the breaking down of the principle of contraction, stating that the tube, while flowing full, gave such discharge as to indicate a much larger area of stream.

It can be shown, however, that the tube under such conditions was not filled with a solid stream; but the stream was so broken that air was traveling up against the current, running a broken field, so to speak, thus eliminating the eddy currents that were thought to exist. The "standard tube" is a misnomer. A standard tube for low heads becomes an orifice for high heads, and the higher the head, the longer the tube must be.

So we are not confined to the laymen in our discovery of false statements. A noted authority on naval architecture and marine engineering makes a statement in one of his books that the difference in boat friction on one hand and pipe friction on the other can be

explained by the fact that the boat drags some of the water along with it. This statement was made in explaining why the frictional resistance does not change exactly as the square of the speed. His explanation is quite satisfactory to those who assume that the boat and the water pipe are different in this respect, but the statement is imperatively erroneous. The two cases assumed to be different are in reality the same. In fact engineering literature for twenty years prior to the appearance of this contribution is crowded with articles supporting the theory of pipe flow in perfect accord with the theory of skin resistance for boats.

If the physical reasons were sought more eagerly and subjected to more rigid scrutiny, such mistakes would not be so common.

REPORTS FROM SIGMA XI FELLOWS FOR 1926-27

PROF. MARSTON T. BOGERT:

Aid was granted for research work under way in the field of synthetic drugs. The special problem was the preparation of some new analogs of cinchophen and a study of the pharmacological effects. The chemical part of the work is fully described in a dissertation for the doctorate submitted to Columbia University by Eugene M. McCollm, which sets forth the account of the preparation of thirteen new compounds. The reports on the pharmacological tests of these products are not ready for publication. Professor Bogert writes: "It has been my thought in connection with work of this kind that we would publish two different sets of papers, one covering the chemical research and the other the pharmacological. We will keep you posted on all developments."

DR. BRUCE FINK:

"I wish to report progress in the work on the proposed manual of lichens of the United States. At the close of the first semester of the present year, we had added about 300 to the number of species described, bringing the number described up to about 1400 of a total of probably 2000 species and subspecies for the manual. I think it is fair to say that Miss Joyce Hedrick handled more than 100 of these on the grant of \$300 from Sigma Xi. Thus far in the present semester we have been obliged to give the time to determinations of about 1000 specimens from various parts of the United States in order to proceed with the descriptions, on which we are just beginning again.

"Miss Hedrick is rapidly rounding into an expert lichenist and the proposition is to put her on full time for the next two years instead of half time as in the last two years. Furthermore, Dr. A. Zahlbruckner, of Vienna, Austria, in my opinion the greatest systematic lichenist of all time, is to be paid to look up and describe for the manual, types in European herbaria. He is now working at Vienna and will later go to Helsingfors and Geneva and perhaps to Paris or Upsala or both. I am pledging myself not to ask aid from any source after the close of the college year 1928 and '29, at which time I expect to have the descriptions and many other final details finished and the manual ready for printing.

"Miami University may be depended on to double her aid or somewhat more for next year, and I am hoping the Sigma Xi and A. A. S. may find it possible to aid to the extent of \$300 each as for the last two years.

"Myself, Miami University, and very many botanists deeply interested in the project are very greatly obliged for the aid that Sigma Xi is able to give."

DR. CARL D. LA RUE:

"Thus far one-half of the sum granted me by the Sigma Xi Committee on Research has been expended. The remainder will be used in continuing work on the same forms as those studied during the past ten months.

"A considerable amount of work has been expended on methods of growing mosses in culture. Regeneration studies have been made on some thirty species and isolated clones of many of these are now in culture. In nine species diploid gametophytes have been secured by regeneration from sporophytes. When these fruit, an attempt will be made to secure tetraploid gametophytes and to make crosses between the various types. The technique of making chromosome counts in moss nuclei has been developed and the chromosome numbers of several species have been determined.

"I wish to express my gratitude to the Sigma Xi Committee on Research Grants for the assistance which they have given me."

DR. ROY L. MOODIE:

Report of progress in research work in paleopathology during the past twelve months, aided by grants from the Sigma Xi.

PUBLICATIONS

1. A Cretaceous Fish Spine. *Amer. Natl.*, IX, 290-293; 2 figs.: May-June, 1926.
2. La Paléopathologie des Mammifères du Pléistocène. *Biologie Médicale*, xvi, 431-440; 8 figs. (This is one of a series of short papers intended to arouse interest in the publication of a French translation of my "Paleopathology," Urbana, 1923. In this I am aided by Dr. Leon Azoulav and Dr. Robert Pierret.)

*Studies in Paleopathology. XIV. A Prehistoric Surgical

* This and the following studies in paleopathology are to be issued in volume form from the press of Paul B. Hoeber.

- Bandage from Peru. *Annals of Medical History*, VIII, 69-72; 4 figs.
4. Studies in Paleopathology. XV. Spondylitis Deformans in a Crocodile from the Pleistocene of Cuba. *Annals of Medical History*, VIII, 78-82, 1926; 6 figs.
 5. Studies in Paleopathology. XVI. Excess Callus following Fracture of the Fore Arm in a Cretaceous Dinosaur. *Annals of Medical History*, VIII, 73-77; 5 figs.
 6. Studies in Paleopathology. XVII. An Alveolar Abscess in the Mandible of an Extinct Mammal. *Annals of Medical History*, VIII, 280-284; 4 figs.; Sept., 1926.
 7. Studies in Paleopathology. XVIII. Tumors of the Head among Pre-Columbian Peruvians. *Annals of Medical History*, VIII, 394-412; 15 figs.
 8. Studies in Paleopathology. XIX. Pleistocene Examples of Traumatic Osteomyelitis. *Annals of Medical History*, VIII, 413-418; 4 figs.
 9. Recent Advances in Paleopathology. A Series of Short Reviews. *Annals of Medical History*, VIII, 327-330.
 10. Studies in Paleopathology. XX. Vertebral Lesions in the Sabre-tooth, Pleistocene of California, Resembling the So-called Myositis Ossificans Progressiva, Compared with Certain Ossifications in the Dinosaurs. *Annals of Medical History*, IX, 91-102; 11 figs.; March, 1927.

STUDIES NEARING COMPLETION

11. Studies in Paleopathology. XXI. Injuries to the Head among Pre-Columbian Peruvians. *Annals of Medical History*, 60 figs.
12. Studies in Paleopathology. XXII. Surgery in Pre-Columbian Peru. (Illustrations and notes completed.)
13. Studies in Paleopathology. XXIII. Pathological Changes among the Great Ground Sloths. Almost completed.
14. Studies in Paleopathology. XXIV. Absence of Caput femoris in a Pleistocene Wolf. Ready for press.
15. Pennsylvanian Vertebrates. *Ky. Geol. Survey*.
16. Roentgenological Evidences of Disease in Ancient Egyptian and Peruvian Mummies. Under way.
17. The Histological Structure of Ossified Tendons Found in Dinosaurs. American Museum Novitates.

18. Structure of the Mandibular Canal in a Fossil Rhinoceros. In progress.

PROF. CHARLES J. LYON:

"In reply to your request for a statement of the work done during the past year on the basis of the Sigma Xi Fellowship, I am able to report that the manuscript of the translation of the author's annotated copy of Kostytschew's *Pflanzenatmung* has been in the hands of the publisher since last November. They advised me in December that they were forced to shelve my manuscript until certain other books were off the press. Lately they have assured me that I may expect to receive galley proof in the near future and that the book will appear in time for the fall trade.

"I have regretted the delay in giving your society definite results from your grant and I shall expedite my end of the work this summer."

DR. ELBERT C. COLE:

"The major part of the year has been spent in perfecting a methylene blue technique that will give fairly uniform results. The relation of hydrogen-ion concentration to the effective use of the stain has been studied. Similarly the effects of various solvents has been investigated. Use has been made of the facilities of Harvard University, through use of its libraries of reference literature, and through conference there with men who are using the methylene blue technique for the study of nervous tissue.

"A generous supply of guinea pigs has been made possible through the stipend granted, and a considerable amount of valuable data secured regarding the innervation of the digestive tract. Amphibian material has also been used. No satisfactory human material has been secured as yet, but a standing arrangement has been made with the Massachusetts General Hospital, whereby the undersigned is to be notified in case suitable material seems likely to be available. It appears that the study of tumorous and cancerous intestinal tissues are valuable corollaries of the main problem.

"To summarize: The stipend granted has made possible a detailed study of the methylene blue technique as applied to the structure of the mammalian intestinal innervation. This work, combined with that of earlier studies on the enteric nervous system of fishes, and amphibians, represents a further step in the comparative study of the

vertebrate enteric nervous mechanism. These studies form the background for a study of the myenteric plexus in the human being. Since no satisfactory human material has as yet been secured no sound conclusions can be reached as to the structural conditions in the human intestine.

"The writer wishes to express to the Sigma Xi his warm appreciation of financial support in the furtherance of what is deemed to be an important piece of investigation."

MRS. HELEN SOROKIN:

The present report is preliminary because only part of the period provided for in the present grant has elapsed.

"The general project as it was submitted involved the investigation on the individuality of chromosomes in various representatives of the Ranunculaceae, with special reference to morphology, variation and heredity. The study is a continuation of work which has been carried on for a number of years.¹

"For convenience certain phases of the general problem were taken as separate units. Three principal phases have been given special attention. The first phase was a statistical study of different types of somatic mitoses present in the same plant during different periods of development. The biometric part of this study is carried out under the advice of Dr. J. Arthur Harris and has yielded some interesting results, but is not completed yet for the press.

"The second phase involved a study of variation in the homeotypic division in *Ranunculus acris* L. This study has just been completed and the paper under the title 'Variation in Homeotypic Division in *Ranunculus Acris*' is accepted for publication in the *American Journal of Botany*, April 15, 1927. According to the Editor-in-Chief the article will appear sometime next winter. I have the pleasure of submitting with the present report a carbon copy of the paper and photographs of the original plates." (The Secretary has this copy.—ED.)

"The third phase of the problem, a review of the number of chromosomes in a series of Ranunculaceae with special reference to the

¹ Helen Sorokin, On the Influence of External Conditions on the Variation of *Anemone nemorosa* L. *Trav. Soc. Natur. Petrograd*, 53, 49-62 (1922).

The Satellites of the Somatic Mitoses in *Ranunculus acris* L. *Public. Fac. Sci. Univ. Charles* (Prague), 13, 1-15 (1924).

A Study of Meiosis in *Ranunculus acris*. *Amer. Jour. Bot.*, 14, 76-84 (1927).
Cytological and Morphological Investigations, Gynodimorphic and Normal Forms of *Ranunculus acris* L. *Genetics*, 12 (January issue) (1927).

individuality of the chromosomes and the presence of satellites, is under investigation. In a number of Ranunculaceae already studied satellites have been found and the number of the chromosomes determined. For some other genera and species certain data are still lacking. This problem requires a study throughout the spring and early summer because the Ranunculaceae flower mostly during this period.

"I have the pleasure of submitting herewith one of previous studies on cytology of *Ranunculus acris* recently published. Another paper on cytology of mutating races of *Ranunculus acris* will appear in the next number of *Genetics*." (These are deposited in the office of the Secretary.—ED.)

PROF. E. S. C. SMITH:

"The problem to which the Sigma Xi Research Grant is being applied is briefly the mapping and general investigation of a large area of granitic rocks in the central part of the State of Maine, including Mount Katahdin, the highest in the State together with some adjacent prominences.

"This area consists of about two hundred square miles of nearly pathless wilderness, and the difficulties of examining such a country are only partly recompensed by the fact that outcrops are plenty due to natural erosion which has been accelerated by lumbering operations and forest fires.

"Work was begun in 1923 when there were peculiarly good opportunities for studying the main mountain, and it has been continued in 1925 and 1926. Further work is planned for 1927 field season.

"The boundaries of the granite have been worked out in part and appear to be gneisses and schists of undetermined age on the south, Devonian sandstones on the northwest and Silurian (?) slates and limestones on the east. Much more field work will be necessary before exact delimitation can be made, or the age of the intrusive mass determined. Upwards of one hundred specimens of the granite and surrounding rocks have been taken and are being studied in the laboratory, which include granite, pegmatite stringers and basic segregations. Basic dikes are practically absent.

"A paper entitled 'Rock Creep on Mt. Katahdin' has been published in the *Geographical Review*, July, 1924, and others are in preparation."

MR. FLOYD L. WINTER:

"The following facts have been obtained:

"1. Continuous selection for high and low oil, and high and low protein content in maize over a period of 28 years has changed the mean of the population in respect to these characters considerably.

"2. The coefficient of variation increases when selection is employed to reduce the mean and decreases when selection is employed to raise the mean in respect to both the oil and protein content.

"3. As measured by a fitted straight line, the increase in the coefficient of variability for the low oil strain is from 8.5% to 14.4%. The decrease in the high oil strain is from 8.1% to 6.7%.

"4. The general trend of the standard deviation is to increase as the mean increases and to decrease as the mean decreases. As measured by a fitted straight line, the increase in the standard deviation for the high oil is from 0.42% to 0.78% and the decrease for the low oil is from 0.34% to 0.24%."

PROF. LEWIS M. TURNER:

"The investigator arrived at the Illinois River at Kampsville with the boat and equipment on Monday, June 25. The boat was not launched until the following Saturday since there was some work to be done to complete it, that was, the completion of the skag, rudder and shaft bearing. After launching six more days were consumed in making the boat ready for the summer's work. The motor originally installed proved to be somewhat unreliable and caused some delay and irregularity in the original plans and was subsequently junked and replaced with a dependable marine motor at Beardstown later in the summer (August 2, 1926).

"The first month was spent near Kampsville. During that period the investigator made a preliminary survey of that area and incidentally became adapted to the rather novel living conditions. The territory on both sides of the river from Kampsville to a point two miles north of the town was covered thoroughly to gain a knowledge of the set-up of conditions existing there. Inhabitants of the region were questioned at every opportunity to collect as much historical information as possible. The owners of the land involved were questioned particularly to secure dates of the more important events occurring in the vicinity pertinent to the problem.

"During this period an observation station was established on shore near the center of the field to be investigated. A preliminary

plant census was taken, plants were collected, identified and pressed for the investigator's private herbarium. Some data were secured on soil conditions, etc.

"The investigator, feeling that an inclusive and comprehensive survey of the entire field would be expedient and desirable, started up river on July 27th. Comparative observations were made at intervals on the condition of the levees and the plants thereon, the shore plants, the strictly aquatic plants, the leveed districts, the ditches, and the inland lakes paralleling the river, up to Beardstown where a week and a half were consumed in installing a new motor and investigating the Beardstown area. From August 10th until August 12th was consumed in making a slow move to Havana. Some preliminary superficial examinations were made enroute. From August 12th until the 23rd the investigator worked the territory above and below Havana eight miles in each direction. Particular attention was given to the establishing of comparative observation stations on levees and in the leveed districts of different ages and a preliminary plant census and data were collected at four stations. On August 23rd the trip northward was resumed and Peoria was reached on August 26th. The river from Havana northward was observed very closely for evidence of pollution, particularly pollution as evidenced by the presence or absence of aquatic plant life. Data were secured and observations made at six points between Peoria and Havana and eight points between Peoria and a point three miles above Starved Rock (Ottawa, Ill.).

"On August 28th the investigator was joined at Havana by Dr. W. B. McDougall (Botany Dept., Univ. of Illinois), who accompanied him to Kampsville, being on board six days.

"The Kampsville area was visited four times during the winter to secure pictures and data on the winter condition both under normal and flooded conditions."

PROF. ANN MORGAN:

"The work which is being aided by the grant from the Society of the Sigma Xi, awarded to the Zoology Department at Mount Holyoke College in December, is an histological study of blood. Three lines of work are being followed:

"First, an investigation has been made of normal rat blood by various techniques and following that studies were carried out on animals which were fed thyroid extract. This last experimental

work has covered a period of several months, during which counts have been made on rats with different thyroid dosages. The material for this is just being brought together so that a definite report is not available at this time.

"A second line of work was started but is now being delayed because the emphasis has been put on the other two.

"The third problem has dealt with the study of blood of two normal women on consecutive days. After the usual period of preliminary work the following counts were made from which conclusions may be drawn.

MENSTRUAL PERIOD

- Series 1 Three days, eight-hour periods
- Series 2 Three days, eight-hour periods
- Series 3 Three days, eight-hour periods
- Series 4 Three days, eight-hour periods
- Series 5 Three days, eight-hour periods, and one ten and a half-hour period
- Series 6 Three days, seven-hour periods

INTERMEDIATE PERIOD

- Series 7 Two days, eight-hour periods
- Series 8 Two days, eight-hour periods

"The counts were made at fifteen minute intervals and included totals as well as differentials. Supravital technique according to Sabin has been used throughout and this has been supplemented by fixed smears stained with Wright's. Graphs have been made for each series and these will be used as the basis for the conclusions which will be drawn."

AWARDS BY THE FELLOWSHIP COMMITTEE FOR 1927-28

MRS. MATILDA MOLDENHAUER BROOKS, Rutgers University;

A grant of \$250 to aid in the study on the penetration of oxidation-reduction indicators into living cells.

PROF. ELBERT C. COLE, Williams College:

A grant of \$125 to defray expenses connected with investigations relating to the innervation of the digestive tubes of mammals, with especial reference to the euteric innervation in man.

PROF. DONALD W. DAVIS, College of William and Mary:

A grant of \$250 to aid in the study of Genetics of Garden Balsam.

MR. CLIFFORD N. FARR, Washington University:

A grant of \$250 for study of specific effects of individual ions upon the process of cell enlargement.

PROF. BRUCE FINK, Miami University:

A grant of \$300 to aid in preparation of a comprehensive manual on lichens. (Miami University and the American Association for the Advancement of Science contribute like amounts.)

PROF. ROY L. MOODIE, University of Illinois:

A grant of \$400 for further studies in paleopathology.

MR. OSCAR W. RICHARDS, Harvard University:

A grant of \$350 to complete analysis of yeast growth, with special reference to the influences which reduce the growth rate from a logarithmic increase gradually to an equilibrium rate.

PROF. E. S. C. SMITH, Union College:

A grant of \$100 to continue studies of certain problems connected with the Katahdin granite mass of central Maine.

W. R. WHITNEY

JOHN H. NORTHRUP

E. L. THORNDIKE

[The Fellowship Committee regrets to announce the sudden death of Dr. Fink on July 10th from heart disease. President Hughes of Miami University writes the committee as follows:

"Since Dr. Fink's death, his family and Miami University have agreed to use their very best efforts to complete the work which he has begun. He had trained Miss Joyce Hedrick to make the descriptions of the lichens, and he assured me that she was able to complete this work. The family has agreed to put a considerable sum of money into this and the University is continuing to support Miss Hedrick in part. If you are willing to allow the grant of \$300 to go toward this work it will be used in paying a part of Miss Hedrick's salary of \$1600. Miss Hedrick will teach one class three hours a week and devote all the rest of her time to Dr. Fink's research. The University will pay the balance of her salary—all of it, if it must be so—through the coming year. We shall greatly appreciate your permission to use this fund for the completion of this work of Dr. Fink's on lichens if the Society feels able to do so."

On August 9th, the Fellowship Committee voted unanimously to grant to Miss Hedrick the award made originally to Dr. Fink. This announcement is appended to the above report by the secretary of the Society.]

A SIGMA XI RESEARCH FUND AT THE UNIVERSITY OF PENNSYLVANIA

The Pennsylvania Chapter, out of its excess funds, has created a research fund for the encouragement and promotion of research projects on the campus of that institution. Researches within any of the fields recognized in the membership of the Society are eligible to an award. The money is not offered as prizes or for work already completed or for projects not already advanced.

At a spring meeting of the chapter awards were made as follows:

1. \$100 to Doctor A. Irving Hallowell, Department of Anthropology, for the study of geographical distribution of relationship terms employed by certain North American Indians, and tracing back the terms historically, and to study the influence which has been exerted on Algonkian speakers by peoples of contiguous stocks.
2. \$100 to Doctor Herbert Fox, Director of the Pepper Laboratory of Clinical Medicine, for the investigation of all cases of anaemia in which it is feasible to pass a tube into the small intestine, and which will be retained sufficiently long to be localized by the X-ray.

MICHIGAN STATE COLLEGE INSTALLATION

The installation of the Michigan State College Chapter of the Society of Sigma Xi was held at East Lansing on March 2nd. The first event of the day occurred at 3 P.M. The officers, delegates and local members, in academic costume, assembled at the main engineering building, and marched to the library building. Dr. F. R. Moulton, President of the Society of Sigma Xi, led the procession, escorted by Dean G. W. Bissell, the chairman of the local Sigma Xi group. Following in line were the delegates from other chapters, and finally the members of the faculty and experiment station staffs who had been elected to Sigma Xi membership elsewhere. About 60 were in line altogether, and on arriving at the Library Building proceeded to the Graduate Study Room, in which the installation ceremony was held.

Doctor Moulton presided as installing officer, and presented the charter to the new chapter. The charter was received on behalf of the local group by Dean Bissell, who expressed the sincere appreciation of the chapter relationship, and pledged the new chapter to abide by the provisions of the charter and to further the fundamental spirit of Sigma Xi.

Felicitations were then conveyed to the new chapter by Mr. Edward M. Bragg, Professor of Marine Engineering and Naval Architecture in the University of Michigan and also president of the University of Michigan Chapter. The president of Purdue chapter, Mr. Alfred P. Poorman, Professor of Applied Mechanics, presented the felicitations of Purdue. Dr. M. M. McCool and Dr. P. M. Harmer, of the Michigan State College, delegates designated from Cornell and Minnesota, respectively, presented the good wishes of their chapters. Dean Bissell then read congratulatory letters and telegrams from a number of other chapters. The following members of other chapters residing in and about Lansing were present: Mrs. H. C. Moore of Cornell, Prof. A. C. Melick of Ohio State University, Dr. N. W. Larkum of Yale, Dr. C. C. Young of Kansas, Mr. M. L. Williams of Union College and Mrs. C. M. Cade and Miss Ada Hunt, both of Illinois.

At 6:30 P.M. a formal banquet was tendered Doctor Moulton and the visiting delegates by the local chapter. The banquet was held in the Union Memorial Building, and all the faculty members of the

college were invited. Brief toasts were given by Doctor Moulton and Dr. K. L. Butterfield, the President of the Michigan State College. The banquet then adjourned to the Chemistry Lecture Room, where the first Annual Sigma Xi Lecture was held. This lecture was open to the general public. Doctor Moulton, who is professor of astronomy at the University of Chicago, gave the address of the evening, on the subject: "Recent Explorations in Space and Time." The lecture was illustrated with very fine lantern slides. This was the final event of the installation program.

One of the gratifying features of the installation was the generous expression of good will on the part of everyone, both in and out of Sigma Xi. With such a backing, the Michigan State College Chapter feels it can face the future, confident that it may be of increasing service to the cause of research in science in the institution which it is designed to serve.

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SIGMA XI CLUBS

CHAPTER	PRESIDENT	VICE-PRES.	SECRETARY	TREASURER
Oklahoma.....	S. Neidman....	Bruce Houston.	Wm. Schriever.	Wm. Schriever
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Southern California...	Edgar Baruch..	R. W. Sorensen	F. J. Smiley...	F. J. Smiley....
Duluth.....	E. W. Kelly....
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Carleton College.....	H. E. Stork....	F. F. Exner....	C. H. Gingrich.	C. H. Gingrich
University of Denver.....	T. R. Garth....	R. E. Nyswander	E. A. Engle....	W. H. Hyslop
Oregon State Agricultural College.....	W. V. Halversen	C. H. Owens...	C. H. Owens...
West Virginia University...	A. M. Reese....	J. H. Gill.....	R. P. Davis....
University of Maine.....	Albert Fitch...	J. W. Gowen...	Edith M. Patch	Edith M. Patch
University of Pittsburgh...	K. D. Swartzel.	O. H. Blackwood	Richard Hamer	Richard Hamer
University of Wyoming...	Aven Nelson...	J. A. Hill.....	O. H. Rechar.	O. H. Rechar
University of Florida.....	G. F. Weber...	T. R. Leigh....	F. J. Bacon....	F. J. Bacon
University of Rochester...	J. R. Murlin...	H. L. Alling....	H. L. Alling
Colorado State Agricultural College.....	G. T. Avery...	L. D. Crain....	L. W. Durrell..	L. W. Durrell

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LIST FURNISHED BY THE CORRESPONDING SECRETARIES OF THE CHAPTER

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	G. W. Bissell..	G. H. Coons...	R. M. Snyder..	J. W. Crist

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OFFICIAL ANNOUNCEMENTS

All insignia of the Society are available only through the office of the national secretary. Orders for these insignia are issued through chapter secretaries, and must be **prepaid**. Information about styles and prices may be obtained from chapter secretaries or the national secretary.

PRINTED BLANKS

The General Convention has instructed the secretary to forward to chapters under the following stipulations:

Membership Certificates, stamped with the great seal of the Society. In packages of fifty prepaid, on advance payment of \$2.50 for each package. Please specify carefully whether for active or associate members.

Index Cards, provided a duplicate set be sent for the general index of the Society maintained in the secretary's office. Gratis.

Chapter secretaries are requested to fill out these cards carefully giving **PERMANENT** addresses of the members, and return to the national secretary.

A few copies of the Quarter Century Record are available at \$2.50 each.

Copies of the Constitution are available at 7 cents each.

SIGMA XI BANNERS

Chapters may obtain Sigma Xi Banners at the following prices:

Size 3 x 5—\$ 8.00

4 x 6— 12.00

5 x 8— 20.00

CHANGES OF ADDRESS

All changes of address and all other correspondence should be addressed to the secretary of Sigma Xi, Edward Ellery, Union College, Schenectady, N. Y.

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